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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,944	10/17/2003	Patrick L. Connor	P16579	9912
7590 07/21/2005				
KONRAD RAYNES VICTOR & MANN LLP		EXAMINER		
Suite 210		LEE, CHUN KUAN		
315 S. Beverly Drive		ART UNIT		
Beverly Hills, CA 90212		2182		
		PAPER NUMBER		

DATE MAILED: 07/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/687,944

Applicant(s)

CONNOR, PATRICK L.

Examiner

Chun-Kuan (Mike) Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07/18/2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 06/23/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “data storage” and “data storage controller” in claim 19 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

2. Claim 9 is objected to because of the following informalities: the claim appears to be lack the statement as to where the processor is located. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Awasthi (US Patent Publication 2002/0087712) in view of Campbell et al. (US Patent 6,779,054).

3. As per claim 1 and 22, Awasthi teaches a system method comprising:  
configuring a pluralities of conditional values comprising of data packet transmit size, queue threshold, queue size and arrival rate threshold (T) base on hardware and software considerations (page 1, [0017]; page 2, [0018]-[0020], [0022] and [0027]);  
measuring a rate of arrival of one or more interrupt events(page 2, [0021] and page3, [0029]) and

asserting an interrupt, in response to the measured rate of arrival of the one or more interrupt events being lower than the interrupt event arrival rates configured in the plurality of timers (page 1, [0011] and page 3, [0029]).

Awasthi fails to teach specifically the usage of plurality of timers in said method.

Campbell teaches the use of timer to regulate interrupts send to computational devices (column 1, lines 60-63; column 4, line 67 and column 5, lines 1-16).

It would have been obvious to one of ordinary skill in this art, at the time of invention was made to implement the use of timer in Campbell's I/O controller that regulates interrupts that are send to a computational device into Awasthi's interrupt regulating system method, which uses a pluralities of conditional values, because both are for regulation of interrupts being send to a computational device and one of the potential usage is having said regulation based on traffic pattern (Campbell, column 5, lines 66-67 and column 6, lines 1-4).

4. As per claim 2, 3, 4, 5, 6, 8, 23, 24, 25, 26, 27 and 29, please view claims 1 and 22 above in view of Awasthi and Campbell, Awasthi further teaches a system method comprising:

one or more interrupt events are arrivals of packets (page 1, [0017]) and the use of a plurality of conditional values to increase the throughput of data (page 2, [0023] and page 3, [0032]-[0033]);

a delay of sending an interrupt if the arrival rate is above the threshold value (page 3, [0030]);

generation of a single interrupt as a result of the “configuration, measurement and assertion” (page 3, [0030]-[0031]);

the configuration, assertion and measurement are included in a computational device (page 1, [0011] and [0016]; and pages 2-3);

a computational device (page 1, [0011]);

a data storage coupled to the computational device (page 1, [0017]) and

Management of stored data, including how data packets are stored and read and a pointer for reading the data packets. (page 1, [0017]).

Awasthi fails to teach the interrupt event arrival rates are different for at least two timers, and the measuring is performed with the at least two timers;

that in response to asserting the interrupt, plurality of timers are restarted and the use of countdown time period and reset criteria to initialize a plurality of timers and specify the plurality of timers are included in the interrupt modulator.

Campbell teaches that in response of inserting an interrupt, the timer is restarted (column 4, line 67 and column 5, lines 1-16) and

the expiration of the timer after a particular measure of time (column 5, lines 9-16) and a threshold value in relation to reset criteria (column 5, lines 43-57)

It would have been obvious to one of ordinary skill in this art, at the time of invention was made to implement the use of timer and its reset function in Campbell's I/O controller that regulates interrupts that are send to a computational device into Awasthi's interrupt regulating system method, which uses a pluralities of conditional values, because both are for regulation of interrupts being send to a computational

device and one of the potential usage is having said regulation based on traffic pattern (Campbell, column 5, lines 66-67 and column 6, lines 1-4).

In conclusion, it would have been obvious to one of ordinary skill in this art, at the time of invention was made to use plurality of timers in place of plurality of conditional values, therefore it would be obvious that

the interrupt event arrival rates are different for at least two timers, and the measuring is performed with the at least two timers;

the use of a pluralities of times to regulate a latency of sending an interrupt;

the use of pluralities of timers to generate a single interrupt for a plurality of arriving events based on configuration, measurement and assertion and

as a design choice, the "interrupt moderator" can be defined by the configuration and assertion functions and the plurality of timers that are within the computational device, wherein the interrupt moderation level of a first timer is different from an interrupt moderation level of a second timer.

5. As per claim 7 and 28, please view claims 1 and 22 above in view of Awasthi and Campbell. Awasthi further teaches a system method comprising of configuration, measurement, and assertion, including an Input/Output interface (page 1, [0012]) and wherein said method is coupled to a computational device (page 1, [0011])

Awasthi fails to teach specifically that the computational device is capable of receiving the one or more interrupt events to result in interrupts at one rate at which the computational device can process the interrupts without decreasing performance of other functions of the computational device.

Campbell teaches that it is not always desired for the I/O device to generate an interrupt in response of reception of a data packet to be send to a computational device, because this may reduce the amount of processing performed, and result in slower processing rate for the computing platform. It is then obvious that the computational device is capable of receiving the one or more interrupt events to result in interrupts at one rate at which the computational device can process the interrupts without decreasing performance of other functions of the computational device (column 4, lines 54-67).

It would have been obvious to one of ordinary skill in this art, at the time of invention was made to implement the specific regulation of interrupts send to the computational device in Campbell's I/O controller that limits the transmission to a rate at which said computational device can process the interrupts without decreasing performance of other functions of said computational device into Awasthi's interrupt regulating system method, because both are for regulation of interrupts being send to a computational device and one of the potential usage is having the regulation also based on traffic pattern (Campbell, column 5, lines 66-67 and column 6, lines 1-4). It would then be a design choice to refer to said implementation as "interrupt generator".

6. As per claim 9 and 30, please view claims 1, 7, 22 and 28 above in view of Awasthi and Campbell

It appears to be obvious that the configuration of the plurality of timers is based on a consideration of possible load on a processor based on a level of possible interrupts to the processor, because the configuration of the pluralities of timers is



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based on the interrupt event arrival rates and said interrupt event arrival rate is directly related to the generation of interrupts that are to be send to the computational device, wherein said generation of interrupts must be at one rate at which the computational device can process the interrupts without decreasing performance of other functions of the computational device;

it also appears to be obvious that the configuration of the plurality of timers is based on a desired latency of the arriving interrupt events, because the rate of the arriving interrupt events are measured, wherein said measurement is directly related to the assertion of interrupts and wherein said assertion of interrupt must be at one rate at which the computational device can process the interrupts without decreasing performance of other functions of the computational device. Therefore, it is obvious that the configuration of the plurality of times is based on a desired latency of the arriving interrupt events in order to have a efficient throughput of interrupts generated to be processed by the computational device

7. As per claims 10 and 11, please see claims 1, 7, 8, 22, 28 and 29 above in view of Awasthi and Campbell.

8. As per claim 19, please view claims 1, 7, 8, 22, 28 and 29 above in view of Awasthi and Campbell.

9. As per claim 20, please view claims 1, 4, 7, 8, 22, 25, 28 and 29 above in view of Awasthi and Campbell.

10. As per claim 21, please view claims 1, 3, 7, 8, 22, 24, 28 and 29 above in view of Awasthi and Campbell.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chun-Kuan (Mike) Lee whose telephone number is (571)272-0671. The examiner can normally be reached on 8AM to 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Popovici Dov can be reached on (571)272-4083. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3718. Any inquiry of a general nature of relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-2100.

Mailed responses to this action should be sent to:

Commissioner of Patents and Trademarks  
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Faxes for Official/formal (After Final) communications or for informal or draft communications (please label "PROPOSED" or "DRAFT") sent to:

(703) 872-9306

Hand-delivered responses should be brought to:

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Crystal Plaza Two, Lobby Room 1B03, Arlington, VA, 22202Crystal Park II, 2121.

C.K.L.  
07/18/2005

